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LANGLEY RESEARCH CENTER

SA-10-87

DATE: December 22, 1987

To: All Facility Safety Heads
All Facility Coordinators

FROM: Safety Manager, Head, Safety Engineering Branch, SSQRD

SUBJECT: Inadvertent Startup of Sequencer Controlled Equipment at The National Transonic Facility (NTF), Bldg. 1236 During Trouble Shooting

The process control system at the NTF employs an Eagle Signal logic control unit (Sequence Model CP 713) driving multiple input/output units (track Model CP 714) to initiate and control process functions of the NTF liquid nitrogen supply system.

While trouble shooting a ground noise problem, power was removed from a portion of one of the three process control systems which resulted in a liquid nitrogen pump being turned on. Although a personnel safety problem did not occur, due to a Kirk Lock system, this event was surprising and certainly not desired. It was determined that when a particular power condition exists the output module in position 15 of the powered tracks will be energized due to a loss of voltage on the track select and module address lines. The specific power condition is 1) sequencer power off, 2) power on the last track in the driver string secured, thus, removing power from the driver terminator, and 3) power maintained on one or more of the remaining tracks.

The fix in this case was replacement of capacitor C15 with a 1.5K ohm resistor on each CP 714 track select line. This holds the track select line voltage high, keeping all output modules in the off condition and preventing inadvertent start-up of equipment during switching of sequencer and I/O track power. Facility personnel have been in contact with Eagle Signal and they concur with this fix.

Numerous facilities throughout NASA employ similar process control systems. During periods of troubleshooting this condition could exist in a control system in your facility. Users of these types of process control systems should determine if this is possible in their system and take appropriate corrective action to modify hardware or develop troubleshooting procedures that secure operating power to all output module components. For further information, contact Mr. Tom Saunders, Electrical Drives and System Operations Section, at Extension 2701.

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